# SWMM Modelling of Automated Hydraulic Flushing Gate as a Flow Control Structure

**Conference Paper** · November 2018

CITATIONS
0

READS
248

**4 authors**, including:

Leong Geok Teng
University Malaysia Sarawak
**1** PUBLICATION **0** CITATIONS
SEE PROFILE

Charles Hin Joo Bong
University Malaysia Sarawak
**36** PUBLICATIONS **193** CITATIONS
SEE PROFILE

Aminuddin Ab Ghani
Universiti Sains Malaysia
**225** PUBLICATIONS **2,392** CITATIONS
SEE PROFILE

# SWMM Modelling of Automated Hydraulic Flushing Gate as a Flow Control Structure

G. T. Leong[1], C. H. J. Bong[2], A. Hanafusa[3] and A. Ab. Ghani[4]

[1, 2] Department of Civil Engineering, Faculty of Engineering, Universiti Malaysia Sarawak, Malaysia

*E-mail: [1] leongteng93@gmail.com, [2] bhjcharles@unimas.my*

[3] Department of Bio-science and Engineering, College of System Engineering and Science, Shibaura Institute of Technology, Japan

*E-mail: [3]hanafusa@sic.shibaura-it.ac.jp*

[4] River Engineering and Urban Drainage Research Centre (REDAC), Universiti Sains Malaysia, Penang, Malaysia

*E-mail: [4]redac02@usm.my*

This study explores the concept of hydraulic flushing gate with an automated control system as a flow control structure of the urban stormwater system. The research team has implemented a flush gate with the automated control system to the flow of the water in a drainage channel. The flow control structure was used to determine the effectiveness of such design by applying the concept of virtually on a real-world drainage system at Jalan Astana, Kuching. Computer representations of the existing drainage system and flow control structure were built using EPA SWMM 5.0 model. The series of flow control structure was proven to hold the runoff from 10-year storm. The modelling result shows that there is 25.9 % of flow reduction at outlet node. As a modification of the existing drainage system in the urban area involves high construction cost; by installing a flow control structure in the drainage system is an innovative way to control the flow of the water.

Keywords: control system; flow control; flushing gate; runoff; SWMM model

## Introduction

The open stormwater system is frequently used in Malaysia. The system is an important infrastructure to convey excess surface runoffs and efficiently remove surface water from areas posting a threat to human safety or having an adverse effect on human activities. However, due to the intense rain events and reduction of the system performance, water cannot drain out on time and cause flood event. Local authorities had put in efforts on drain-widening projects and drain maintenance to resolve the flood problems. These actions often involve manual handling and very costly. In this paper, the concept of hydraulic flushing gate with the automated control system as a flow control structure of the urban stormwater system is proposed to solve